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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	21

Application Number	09/914,928
Filing Date	09/06/2001
First Named Inventor	Loick Verger
Art Unit	2884
Examiner Name	Sung, Christine
Attorney Docket Number	034299-346

ENCLOSURES ***(check all that apply)***

- ☒ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment / Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
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- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) *(please identify below)*:

Postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm	Thelen Reid Brown Raysman & Steiner LLP		
Signature			
Printed Name	Khaled Shami		
Date	10/16/2007	Reg. No.	38,745

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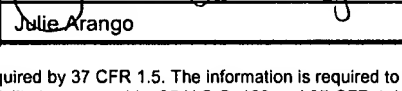
Signature			
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PTO/SB/17 (10-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL for FY 2008

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 510.00

Complete if Known	
Application Number	09/914,928
Filing Date	09/06/2001
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Art Unit	2884
Attorney Docket No.	034299-346

METHOD OF PAYMENT (check all that apply)

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
		Small Entity		Small Entity		Small Entity	
Application Type	Fee ($)	Fee($)	Fee($)	Fee($)	Fee($)	Fee($)	Fees Paid ($)
Utility	310	155	510	255	210	105	____
Design	210	105	100	50	130	65	____
Plant	210	105	310	155	160	80	____
Reissue	310	155	510	255	620	310	____
Provisional	210	105	0	0	0	0	____

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	210	105
Multiple dependent claims	370	185

Total Claims		Extra Claims		Fee($)		Fee Paid ($)
____	-20 or HP=	____	x	____	=	____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		Extra Claims		Fee($)		Fee Paid ($)
____	- 3 or HP=	____	x	____	=	____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	
Fee ($)	Fee Paid ($)
____	____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
____	- 100 =	____	/ 50 =	____	(round **up** to a whole number) x	____	=	____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	____
Other (e.g., late filing surcharge) : Filing a brief in support of an appeal	510.00

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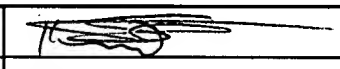
Signature		Registration No. (Attorney/Agent)	38,745	Telephone	408-292-5800
Name (Print/Type)	Khaled Shami			Date	10/16/2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Loick Verger et al.	CONFIRMATION NO.:	5963
SERIAL NO.:	09/914,928		
FILING DATE:	09/06/2001		
TITLE:	X-RAY IMAGING DEVICE AND METHOD FOR MAKING SAME		
EXAMINER:	Sung, Christine		
ART UNIT:	2884		

CERTIFICATE OF MAILING

I hereby certify that this paper is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450, on the date printed below:

Date: 10/16/2007 Name: Julie Arango
Julie Arango

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APPEAL BRIEF

Dear Sir:

This paper is in support of a Notice to Appeal filed August 20, 2007, of the Office Action dated April 17, 2007, to the Board of Patent Appeals and Interferences.

TABLE OF CONTENTS

REAL PARTY IN INTEREST

Commissariat a L'Energie Atomique.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Claim 11 has been canceled.

Claims 1-10 and 12-20 have been finally rejected and are on appeal.

STATUS OF AMENDMENTS

An amendment after final was filed on August 16, 2007, and has been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention relates to X-ray imaging devices and the fabrication of same. Claim 1 is directed to a X-radiation imagery device comprising at least one detection matrix. The detection matrix includes an electric charges reading panel (10; FIG. 1; p. 7, l. 21) having an area equal to or larger than about 10 cm x 10 cm (p.5, l. 27; p. 12, l. 21; l. 27), the electric charges reading panel including a monocrystalline silicon substrate (10) integrating a plurality of electronic devices, and a detection layer made of a continuous layer of semiconducting material (#13, FIG. 1, p. 8, ll. 3-4; #24, FIG. 2C, p. 13, ll. 1-2) deposited in vapour phase on the electric charges reading panel (p. 8, ll. 1-5), the detection layer converting incident X photons into electric charges, each electronic device and a portion of the detection layer formed thereon forming a respective pixel of the detection matrix.

Claim 2 is directed to a process for making an X-radiation imagery device comprising at least one detection matrix. The detection matrix includes (a) an electric charges reading panel (10; FIG. 1; p. 7, l. 21) having an area equal to or larger than about 10 cm x 10 cm (p.5, l. 27; p. 12, l. 21; l. 27), the electric charges reading panel including a monocrystalline silicon substrate (10) integrating a plurality of electronic devices, and (b) a detection layer made of a semiconducting material (#13, FIG. 1, p. 8, ll. 3-4; #24, FIG. 2C, p. 13, ll. 1-2) converting incident X photons into electric charges. The process includes forming the electronic devices on the monocrystalline silicon substrate to produce the electric charges reading panel, and vapour-phase depositing (p. 8, ll. 1-5) the semiconducting material on the electric charges reading panel so as to form the detection layer made of a continuous layer of the semiconducting material, thereby forming a matrix of detection pixels, each detection pixel including a corresponding electronic device and a portion of the detection layer formed thereon.

Claim 14 is directed to X-radiation imagery device that includes at least one detection matrix. The detection matrix includes an electric charges reading panel (10; FIG. 1; p. 7, l. 21) having an area equal to or larger than about 10 cm x 10 cm (p.5, l. 27; p. 12, l. 21; l. 27), the electric charges reading panel including a monocrystalline silicon substrate (10) integrating a plurality of electronic devices, each electronic device including an amplifier, and a detection

layer made of a continuous layer of a semiconducting material (#13, FIG. 1, p. 8, ll. 3-4; #24, FIG. 2C, p. 13, ll. 1-2) deposited in vapour phase on the electric charges reading panel (p. 8, ll. 1-5), the detection layer converting incident X photons into electric charges, each electronic device and a portion of the detection layer formed thereon forming a respective pixel of the detection matrix.

Claim 16 is directed to a method for making an X-radiation imagery device comprising at least one detection matrix. The detection matrix includes an electric charges reading panel (10; FIG. 1; p. 7, l. 21) having an area equal to or larger than about 10 cm x 10 cm (p.5, l. 27; p. 12, l. 21; l. 27), the electric charges reading panel including (a) a monocrystalline silicon substrate (10) integrating a plurality of electronic devices, and (b) a detection layer made of a semiconducting material (#13, FIG. 1, p. 8, ll. 3-4; #24, FIG. 2C, p. 13, ll. 1-2) converting incident X photons into electric charges. The process includes forming the electronic devices on the monocrystalline silicon substrate to produce the electric charges reading panel, each of the electronic devices including an amplifier, and vapour-phase depositing (p. 8, ll. 1-5) the semiconducting material on the electric charges reading panel so as to form a continuous detection layer made of thesemiconducting material, thereby forming a matrix of detection pixels, each detection pixel including a corresponding electronic device and a portion of the detection layer formed thereon.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-10 and 12-20 are anticipated under 35 U.S.C. 102(e) by U.S. Pat. No. 5,892,227 (Schieber; hereinafter, "Schieber").

Whether claims 3, 12, 18 and 20 are unpatentable under 35 U.S.C. 103(a) over Schieber.

ARGUMENT

Rejection of Claims 1-10 and 12-20 Under 35 U.S.C. 102(e) Based on Scheiber

Claim 1

Claim 1 recites, *inter alia*, an electric charges reading panel that includes (1) a monocrystalline silicon substrate integrating a plurality of electronic devices, and (2) a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel. These features are not disclosed in Schieber. As seen from FIG. 4 of Scheiber, the HgI_2 layer (allegedly corresponding to the detection layer) has row electrodes formed below it and column electrodes formed above it. This arrangement is described in detail in column 6, lines 16-55 of Scheiber. There is no disclosure in Scheiber of a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel that includes a monocrystalline silicon substrate integrating a plurality of electronic devices. FIG. 7 of Scheiber most clearly bears this out, showing schematically that in the "gamma-ray sensitive front-end," the HgI_2 array (allegedly the detection layer made of a continuous layer of semiconducting material) is separate and distinct from the rest of the circuitry in which the plurality of electronic devices, such as the rows and columns of the multi-channel hybrid preamps or the other components of the "system console," are disposed.

Claim 2

Claim 2 recites, *inter alia*, a process for making an X-radiation imagery device comprising (1) forming the electronic devices on the monocrystalline silicon substrate to produce the electric charges reading panel, and (2) vapour-phase depositing the semiconducting material on the electric charges reading panel so as to form the detection layer made of a continuous layer of the semiconducting material, thereby forming a matrix of detection pixels. These features are not disclosed in Scheiber. As explained above, FIG. 4 of Scheiber shows that the HgI_2 layer (allegedly corresponding to the detection layer) has row electrodes formed below it and column electrodes formed above it. This arrangement is described in detail in column 6, lines 16-55 of Scheiber. There is no disclosure in Scheiber of a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel that

includes a monocrystalline silicon substrate integrating a plurality of electronic devices. FIG. 7 of Scheiber most clearly bears this out, showing schematically that in the "gamma-ray sensitive front-end," the HgI_2 array (allegedly the detection layer made of a continuous layer of semiconducting material) is separate and distinct from the rest of the circuitry in which the plurality of electronic devices, such as the rows and columns of the multi-channel hybrid preamps, or the other components of the "system console," are disposed.

Claim 14

Claim 14 recites, *inter alia*, X-radiation imagery device comprising at least one detection matrix that comprises (1) an electric charges reading panel having an area equal to or larger than about 10 cm x 10 cm, said electric charges reading panel including a monocrystalline silicon substrate integrating a plurality of electronic devices, each electronic device including an amplifier, and (2) a detection layer made of a continuous layer of a semiconducting material deposited in vapour phase on the electric charges reading panel, the detection layer converting incident X photons into electric charges, each electronic device and a portion of the detection layer formed thereon forming a respective pixel of the detection matrix. These features are not disclosed in Scheiber. As explained above, FIG. 4 of Scheiber shows that the HgI_2 layer (allegedly corresponding to the detection layer) has row electrodes formed below it and column electrodes formed above it. This arrangement is described in detail in column 6, lines 16-55 of Scheiber. There is no disclosure in Scheiber of a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel that includes a monocrystalline silicon substrate integrating a plurality of electronic devices. FIG. 7 of Scheiber most clearly bears this out, showing schematically that in the "gamma-ray sensitive front-end," the HgI_2 array (allegedly the detection layer made of a continuous layer of semiconducting material) is separate and distinct from the rest of the circuitry in which the plurality of electronic devices, such as the rows and columns of the multi-channel hybrid preamps, or the other components and amplifiers of the "system console," are disposed.

Claim 16

Claim 16 recites, *inter alia*, a method for making an X-radiation imagery device comprising (1) forming electronic devices on a monocrystalline silicon substrate to produce an

electric charges reading panel, each of the electronic devices including an amplifier, and (2) vapour-phase depositing a semiconducting material on the electric charges reading panel so as to form a continuous detection layer made of the semiconducting material, thereby forming a matrix of detection pixels, each detection pixel including a corresponding electronic device and a portion of the detection layer formed thereon. These features are not disclosed in Scheiber. As explained above, FIG. 4 of Scheiber shows that the HgI_2 layer (allegedly corresponding to the detection layer) has row electrodes formed below it and column electrodes formed above it. This arrangement is described in detail in column 6, lines 16-55 of Scheiber. There is no disclosure in Scheiber of a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel that includes a monocrystalline silicon substrate integrating a plurality of electronic devices. FIG. 7 of Scheiber most clearly bears this out, showing schematically that in the "gamma-ray sensitive front-end," the HgI_2 array (allegedly the detection layer made of a continuous layer of semiconducting material) is separate and distinct from the rest of the circuitry in which the plurality of electronic devices, such as the rows and columns of the multi-channel hybrid preamps, or the other components and amplifiers of the "system console," are disposed.

Rejection of Claims 3, 12, 18 and 20 Under 35 U.S.C. 103(b)

Claims 3, 12, 18 and 20

Claims 3, 12, 18 and 20 are dependent claims which necessarily include the limitations of the base claims discussed above. The above-discussed missing features are not obvious, and a prima facie case of obviousness with regard to these features has not been established.

CLAIMS APPENDIX

1. X-radiation imagery device comprising at least one detection matrix, said detection matrix comprising:

an electric charges reading panel having an area equal to or larger than about 10 cm x 10 cm, said electric charges reading panel including a monocrystalline silicon substrate integrating a plurality of electronic devices; and a detection layer made of a continuous layer of semiconducting material deposited in vapour phase on the electric charges reading panel, the detection layer converting incident X photons into electric charges, each electronic device and a portion of the detection layer formed thereon forming a respective pixel of the detection matrix.

2. Process for making an X-radiation imagery device comprising at least one detection matrix, said detection matrix comprising (a) an electric charges reading panel having an area equal to or larger than about 10 cm x 10 cm, said electric charges reading panel including a monocrystalline silicon substrate integrating a plurality of electronic devices, and (b) a detection layer made of a semiconducting material converting incident X photons into electric charges, said process comprising:

forming the electronic devices on the monocrystalline silicon substrate to produce the electric charges reading panel; and

vapour-phase depositing the semiconducting material on the electric charges reading panel so as to form the detection layer made of a continuous layer of the semiconducting material, thereby forming a matrix of detection pixels, each detection pixel including a corresponding electronic device and a portion of the detection layer formed thereon.

3. Process according to claim 2, in which the evaporation properties of this semiconductor are such that the deposition can be done at a temperature lower than a temperature that damages the electronic devices.

4. Process according to claim 2, in which the semiconducting material used to make the matrix of detection pixels is CdTe, HgI_2 or PbI_2.

5. Process according to claim 2, in which electronic devices made using a process technology having a feature device size of 1.25 μm are used.

6. Process according to claim 2, in which electronic devices made using a process technology having a feature device size of 0.1 μm are used.

7. X-radiation imagery device according to claim 1, wherein the detection layer is deposited directly on the electronic devices of the electric charges reading panel in each pixel.

8. X-radiation imagery device according to claim 1, wherein the semiconducting material of the detection layer is crystalline silicon.

9. X-radiation imagery device according to claim 1, wherein each of said electronic devices comprising at least one of:

an amplifier;

a preamplifier;

a filter; or

a processing circuit.

10. X-radiation imagery device according to claim 9, wherein said processing circuit includes at lease one of:

a reading circuit;

an integration circuit; or

a counting circuit.

12. The method in accordance with claim 2, wherein said vapour-phase depositing comprises:

controlling a temperature of the deposition so as not to damage the electronic devices of the electric charges reading panel made of monocrystalline silicon.

13. The method in accordance with claim 2, further comprising:

assembling more than one detection matrices to form a large area digital detector.

14. X-radiation imagery device comprising at least one detection matrix, said detection matrix comprising:

an electric charges reading panel having an area equal to or larger than about 10 cm x 10 cm, said electric charges reading panel including a monocrystalline silicon substrate integrating a plurality of electronic devices, each electronic device including an amplifier; and

a detection layer made of a continuous layer of a semiconducting material deposited in vapour phase on the electric charges reading panel, the detection layer converting incident X photons into electric charges, each electronic device and a portion of the detection layer formed thereon forming a respective pixel of the detection matrix.

15. X-radiation imagery device according to claim 14, wherein each of said electronic devices further comprising at least one of:

a preamplifier;

a filter; or

a processing circuit.

16. Method for making an X-radiation imagery device comprising at least one detection matrix, said detection matrix comprising an electric charges reading panel having an area equal to or larger than about 10 cm x 10 cm, said electric charged reading panel including (a) a monocrystalline silicon substrate integrating a plurality of electronic devices, and (b) a detection layer made of a semiconducting material converting incident X photons into electric charges, said method comprising:

forming the electronic devices on the monocrystalline silicon substrate to produce the electric charges reading panel, each of the electronic devices including an amplifier; and

vapour-phase depositing the semiconducting material on the electric charges reading panel so as to form a continuous detection layer made of thesemiconducting material, thereby forming a matrix of detection pixels, each detection pixel including a corresponding electronic device and a portion of the detection layer formed thereon.

17. X-radiation imagery device according to claim 1, wherein said device has a detection area of about one or more dm^2.

18. Process according to claim 2, wherein said monocrystalline silicon substrate is obtained from a monocrystalline silicon wafer having a diameter of about 10 cm to about 30 cm.

19. X-radiation imagery device according to claim 14, wherein said device has a detection area of about a few dm^2.

20. Process according to claim 16, wherein said monocrystalline silicon substrate is obtained from a monocrystalline silicon wafer having a diameter of about 10 cm to about 30 cm.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.

Please charge any additional required fee or credit any overpayment not otherwise paid or credited to our deposit account No. 50-1698.

Respectfully submitted,

THELEN REID BROWN RAYSMAN & STEINER LLP

Dated: 10/16/2007

Khaled Shami
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